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In re the Application of:

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Julie Ann Jerves, and Richard Henry Mandel, III
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METHOD, SYSTEM, PROGRAM, AND DATA STRUCTURE
FOR CLEANING A DATABASE TABLE

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I. Real Party in Interest

The entire right, title and interest in this patent application is assigned to real party in interest International Business Machines Corporation.

II. Related Appeals and Interferences

Appellant is not aware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-46 are pending.

The final rejection of the claims is being appealed for all pending claims 1-46.

No claims have been canceled.

IV. Status of Amendments

A proposed after final amendment was filed by applicants on March 25, 2003 to respond to objections to FIG. 2 and proposing amendments to FIG. 2.

V. Summary of the Invention

The presently claimed invention is directed to performing a clean operation on an input table having an input table name in accordance with one aspect of the invention. At least one rule definition is received. Each rule definition indicates a find criteria, a replacement value, and an input data column in the input table. For each rule definition, a search is performed for the

input data column for any fields that match the find criteria. If the rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria. Subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions.

For example, as described in the specification in connection with one embodiment, a clean transform is implemented as a stored procedure application program 12 in the server 4 (Specification, page 7, lines 21-22; FIG. 1). A rule definition 80 (FIG. 2) includes a rule table name 86 containing find and replace rule patterns (FIG. 3a and 3b), and an input data column name 82 in the input table (Specification, page 9, lines 8-26) For each rule definition 80, a search is performed for the input data column for any fields that match the find criteria (block 218 of FIG. 6a). The output data column name 84 of the rule definition 80 is optional and indicates where cleaned data is placed, and, if the rule definition does not specify an output data column name, the replacement value is directly inserted in the fields in the input data column that match the find criteria (Specification page 9, lines 20-24). Subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions (Specification, page 11, line 26-page 12, line 9).

In another aspect of the invention, each rule definition is associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition (Specification, page 9, lines 25-page 10, line 6; page 10, lines 11-16;

page 11, lines 12-25; page 12, line 26-page13, line 3; FIGs. 3a and 3b).

In a further aspect of the invention, there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition (Specification, page 9, lines 25-page 10, line 6; page 10, lines 11-16; page 11, lines 12-25; page 12, line 26-page13, line 3; FIGs. 3a and 3b).

In yet another aspect of the invention, at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria (Specification, page 11, lines 20-25). Searching the input data column applies each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content (Specification, page 11, lines 20-25). The replacement value corresponding to one find criteria that matched the field content is inserted into the table (Specification, page 11, lines 20-25). Also, a sort column includes values to use to sort the multiple find criteria and corresponding replacement value, and searching applies the multiple find criteria to each field in the order specified in the sort column (Specification, page 10, lines 3-6).

In another aspect of the invention, at least one rule definition includes find criteria having upper and lower bounds and a search is performed for any fields that have values outside of one of the upper and lower bounds (Specification, page 13, lines 5-7).

In a further aspect of the invention, the find criteria for at least one rule definition comprises an upper bound and lower bound, an upper replacement value, and a lower replacement value (FIG. 5). Then, a search is performed for any fields that have values within

the upper and lower bounds, the upper replacement value is inserted if the field has a value greater than the upper bound, and the lower replacement value is inserted if the field has a value less than the lower bound. (Specification, page 13, lines 18-21; FIG. 5)

In yet a further aspect of the invention, the rule definition includes a row clean flag (Specification, page 10, lines 17-20). When, the row clean flag is set, any row including a field matching the search criteria is removed from the input table (Specification, page 10, lines 17-20).

VI. Issues

A concise statement of the issues presented for review is as follows:

A. Issue 1: The Obviousness Rejection Based on the Knudsen and Graefe Combination

Whether the Examiner is correct in rejecting claims 1-7, 13-20, 26-33, and 39-46 as obvious (35 U.S.C. §103(a)) over U.S. Patent No. 5,596,752 (hereinafter the Knudsen patent) in view of U.S. Patent No. 6,298,342 B1 (hereinafter the Graefe patent).

B. Issue 2: The Obviousness Rejection Based on the Knudsen, Graefe, and DeLong Combination

Whether the Examiner is correct in rejecting claims 8-12, 21-25, and 34-38 as obvious (35 U.S.C. §103(a)) over the Knudsen patent in view of the Graefe patent and further in view of U.S. Patent NO. 6,185,552 (hereinafter the DeLong patent).

VII. Grouping of the Claims

With respect to Issue 1 (The Obviousness Rejection Based on the Knudsen and Graefe Combination), claims 1 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 should be treated as one group

(Group 1A), claims 2, 3, 15, 16, 28, 29, 41, and 42 should be treated as a separate group (Group 1B), claims 5, 6, 18, 19, 31, 32, 44, and 45 should be treated as a separate group (Group 1C), claims 13, 26, and 39 should be treated as a separate group (Group 1D),

With respect to Issue 2 (The Obviousness Rejection Based on the Knudsen, Graefe, and DeLong Combination), claims 8-12, 21-25, and 34-38 should be treated as one group (Group 2A).

VIII. Argument

A. Issue 1: The Rejection of Claims 1-7, 13-20, 26-33, and 39-46 as Obvious over the Knudsen Graefe Combination Should be Reversed.

1. Claims 1, 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 (Group 1A) are not Obvious over the Knudsen Graefe Combination.

As set forth above, the present invention is directed to a method, system, program, and data structure for performing a clean operation on an input table. At least one rule definition is received. For each rule definition, a search is performed for the input data column for any fields that match the find criteria. If the rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria.

As explained in greater detail below, the Examiner's combination of the Knudsen and Graefe patents is improper. Additionally, the Examiner is incorrect in rejecting claims 1, 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 (Group 1A) as being unpatentable over the Knudsen patent in view of the Graefe patent. The Examiner has failed to establish that the Knudsen patent or the

Graefe patent, either alone or in combination, have any description, express or inherent, that if a rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria.

Accordingly, it is respectfully submitted that the rejection of claims 1, 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 over the combination of the Knudsen and Graefe patents should be reversed.

The Examiner's combination of the Knudsen and Graefe patents is improper because there is no teaching, suggestion, or motivation to do so.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 U.S.P.Q. 2d 1941 (Fed. Cir. 1992).

Applicants submit that since the Graefe patent always requires a separate input table and a separate output table and moves data from one table to the other, leaving the input table unmodified, while the Knudsen patent inserts data into a table, replaces data within the table, or deletes data from the table, leaving that table modified, there is no motivation to combine the Graefe and Knudsen patents.

In particular, the Graefe patent describes that a pivot operation rotates data items in a table. (Abstract). The first two columns in a pivot specification must be columns in the pivot operation's input table and these columns will not appear in the pivot operation's output table. (Col. 8, lines 12-14) Also, each value in a pivot list within the pivot specification defines a new column in the pivot operation's output table. (Col. 8, lines 14-16) The pivot operation of the

Graefe patent requires a separate output table into which data is inserted and does not insert data into the input table.

Moreover, FIG. 4 of the Graefe patent illustrates the structure of a pivot operation. (Col. 6, lines 48-49) In FIG. 4, the pivoting input table 410 produces output table 430. The pivot operation may create an output table having a different form from that of an input table. For example, input table 410 has four columns and seventeen rows, while output table 430 has six columns and five rows. Thus, the pivot operation may create an output table having a different form from that of an input table, the input and output tables are two separate tables.

On the other hand, the Knudsen patent modifies data in a table with an insert, replace, or delete (Col. 12, line 37-Col. 13, line 37). Thus, the Knudsen patent modifies a table, while the Graefe patent generates a new output table from an input table.

Even if the Knudsen and Graefe patents were combined, since the Graefe patent does not overcome the deficiencies of the Knudsen patent, claims 1, 14, 27, and 40 are not taught or suggested by the Knudsen patent or the Graefe patent, either alone or in combination.

The Examiner concedes that the Knudsen patent does not clearly teach the claim requirement of if the rule definition does not specify an output table, directly in claims 1, 14, 27, and 40 (Final Office Action, page 4). In particular, the Knudsen patent teaches entering new data into a table by first placing new data in appropriate fields of a table template and then executing either a REPLACE or an INSERT statement. (Col. 10, lines 43-54) The entry of information into a table template, rather than directly into an input data column, teaches away from the claim requirement of directly inserting a replacement value into an input data column.

Furthermore, the Knudsen patent does not place a replacement value into a table if a rule

definition does not specify an output table. In fact, the Knudsen patent does not teach or suggest checking whether a rule definition specifies an output table before inserting a replacement value into a table. Therefore, claims 1, 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 (Group 1A) are not taught or suggested by the Knudsen patent.

The Examiner cites the Graefe patent as teaching the claim limitation that if a rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria. Applicants respectfully traverse. First, the Graefe patent does not directly insert a replacement value into an input data column, but moves data from an input table to an output table. Second, the Graefe does not insert data into an input data column if a rule definition does not specify an output table.

In particular, the Graefe patent describes that a pivot operation rotates data items in a table. (Abstract). The first two columns in a pivot specification must be columns in the pivot operation's input table and these columns will not appear in the pivot operation's output table. (Col. 8, lines 12-14) Also, each value in a pivot list within the pivot specification defines a new column in the pivot operation's output table. (Col. 8, lines 14-16) The pivot operation of the Graefe patent requires a separate output table into which data is inserted and does not insert data into the input table. Therefore, the Graefe patent teaches away from the claim requirement that if a rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria.

Moreover, FIG. 4 of the Graefe patent illustrates the structure of a pivot operation. (Col. 6, lines 48-49) In FIG. 4, the pivoting input table 410 produces output table 430. The pivot operation may create an output table having a different form from that of an input table. For

example, input table 410 has four columns and seventeen rows, while output table 430 has six columns and five rows. Thus, the pivot operation may create an output table having a different form from that of an input table, the input and output tables are two separate tables. Thus, there is no need in the Graefe patent to insert a replacement value directly into an input data column if a rule definition does not specify an output table. Again, the Graefe patent teaches away from the claimed subject matter.

Furthermore, in step 540 of FIG. 5 of the Graefe patent, data-item values of the value column are inserted into the rows of the output table. (Col. 9, lines 18-20) One method for insertion is by transposition, in which case each data item in the value column is placed into one of the pivoted columns whose name is the same as the data value in the pivot column of the input table. (Col. 9, lines 20-25) Additionally, step 640 of FIG. 6 transposes the data items from the pivoted table into the unpivoted table. (Col. 10, lines 12-13) That is, the pivot operation does not insert data into the input table. Instead, the pivot operation uses data in the input table to create a pivoted output table. Again, the Graefe patent teaches away the claim requirement of directly inserting a replacement value into an input data column.

The Examiner cites the Graefe patent at col. 7, lines 11-34 as teaching relational algebra and that operations or functions in relational algebra consume one or more input tables and produce an output table according to a rule. (Final Office Action, page 4) The cited portion of the Graefe patent at Col. 7, lines 11-34 indicates that input tables are used to produce separate output tables. This teaches away from the claim requirement of directly inserting a replacement value into an input data column.

The Examiner further states that it would have been obvious to one of ordinary skill in the

art to combine the teaching of Knudsen with the teaching of Graefe because the execution engine has a strictly internal operation for splitting each item of a table updated having the form (row_identifier, old_values, new_values) within a stream of update item into a "delete item" and an "insert item" and an "insert item" into an "update item". (Final Office Action, page 4)

Applicants traverse this finding of obviousness.

Since the Knudsen patent already uses insert and delete statements (Col. 12, line 37-Col. 13, line 37), there is no need to add the teaching of splitting each item of a table updated having the form (row_identifier, old_values, new_values) within a stream of update items into a "delete item" and an "insert item" and a "delete item" into an "update item".

Accordingly, it is respectfully submitted that the rejection of claims 1, 4, 7, 14, 17, 20, 27, 30, 33, 40, 43, and 46 (Group 1A) over the combination of the Knudsen and Graefe patents should be reversed.

2. Claims 2, 3, 15, 16, 28, 29, 41, and 42 (Group 1B) are not Obvious over the Knudsen Graefe Combination.

As for claims 2, 15, and 28, the Examiner cites Col. 5, lines 61-Col. 6, lines 8, Col. 10, lines 55-Col. 11, lines 29, Col. 76, lines 15-35, and Col. 12, lines 37-Col. 13, lines 15 as teaching that each rule definition is associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

The cited portion at Col. 5, lines 61-Col. 6 describes a rule LeapYear that contains the rule header "LeapYear(Year)," a condition of "Remainder(YEAR, 4)=0", and actions that either

return a "Y" if the condition is satisfied or "N" if the condition is not satisfied. This cited portion does not teach or suggest the claim requirement of each rule definition being associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

The cited portion at Col. 10, lines 55-Col. 11, lines 29 does not teach or suggest the claimed requirement of each rule definition being associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition. Instead, the Knudsen patent describes that rules enter new information into the table by first placing the new data in the appropriate fields of a table template and then executing either a REPLACE or an INSERT statement; rules retrieve information from the table into a table template with a GET statement or a FORALL statement; and rules delete information from the table by placing the information in a table template and then executing a DELETE statement (the table template is undefined after a DELETE statement). (Col. 10, lines 43-54) The Knudsen patent also describes GET, FORALL, and DELETE statements. (Col. 10, lines 55-Col. 11, lines 29)

Col. 76, lines 15-35 was cited as teaching Applicant's rule table. The cited portion of Col. 76 describes a TOKENS table, but the TOKENS table is not equivalent to Applicants' rule table. Moreover, the Knudsen patent does not describe the claim requirement of a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

The cited portion at Col. 12, lines 37-Col. 13, lines 15 describes the INSERT and REPLACE statements, which do not teach or suggest the claimed requirement of each rule definition being associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

The Examiner cites the Knudsen patent at Col. 5, lines 61-Col. 6, lines 8, Col. 10, lines 55-Col. 11, lines 29, and Col. 12, lines 37-Col. 13, lines 15 as teaching the claim requirement that there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition.

None of the cited portions of the Knudsen patent teach or suggest the claim requirement that there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition. Instead, the cited portion at Col. 5, lines 61-Col. 6 describes a rule LeapYear. The cited portion at Col. 10, lines 55-Col. 11, lines 29 describes that rules enter new information into the table by first placing the new data in the appropriate fields of a table template and then executing either a REPLACE or an INSERT statement; rules retrieve information from the table into a table template with a GET statement or a FORALL statement; and rules delete information from the table by placing the information in a table template and then executing a DELETE statement; and describes GET, FORALL, and DELETE statements.

The cited portion at Col. 12, lines 37-Col. 13, lines 15 describes the INSERT and REPLACE statements. None of the cited portions even teaches or suggests the claim requirement of separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition.

Accordingly, it is respectfully submitted that the rejection of claims 2, 3, 15, 16, 28, 29, 41, and 42 (Group 1B) over the combination of the Knudsen and Graefe patents should be reversed.

3. Claims 5, 6, 18, 19, 31, 32, 44, and 45 (Group 1C) are not Obvious over the Knudsen Graefe Combination.

The Examiner cites the Knudsen patent at Col. 5, lines 61-Col. 6, lines 8, Col. 10, lines 55-Col. 11, lines 29, Col. 12, lines 37-Col. 13, lines 15, and Col. 70, lines 24-55, as teaching the claim requirement that at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content. The cited text at Col. 70, lines 24-55 describes a LIKE relational operator, but this does not teach or suggest the claim requirement of claim requirement that at least one rule definition includes multiple find criteria and a corresponding

replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content. The remaining cited portions of the Knudsen patent do not teach or suggest the claim requirement of claim requirement that at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

The Examiner cites the Knudsen patent at Col. 5, lines 61-Col. 6, lines 8, Col. 10, lines 55-Col. 11, lines 29, Col. 12, lines 37-Col. 13, lines 15, and Col. 70, lines 24-55, as teaching the claim requirement that a sort column includes values to use to sort the multiple find criteria and corresponding replacement value, wherein the step of searching comprises applying the multiple find criteria to each field in the order specified in the sort column. The Knudsen patent does not teach or suggest the claim requirement of a sort column for applying the multiple find criteria to each field in the order specified in the sort column.

Accordingly, it is respectfully submitted that the rejection of claims 5, 6, 18, 19, 31, 32, 44, and 45 (Group 1C) over the combination of the Knudsen and Graefe patents should be reversed.

4. Claims 13, 26, and 39 (Group 1D) are not Obvious over the Knudsen Graefe Combination.

The Examiner cites the Knudsen patent at Col. 14, lines 59-Col. 15, lines 46 as teaching the claim requirement that the rule definitions include a row clean flag, and at least one rule definition has the row clean flag set, and further comprising removing any row including a field matching the search criteria from the input table when the row clean flag is set. The cited portions of Knudsen patent at Col. 14, line 59-Col. 15, line 46 describe a SCHEDULE statement, a TRANSFERCALL statement, and an EXECUTE statement. None of these statements mentions a row clean flag and removing or mentions removing any row including a field matching the search criteria from the input table when the row clean flag is set.

Accordingly, it is respectfully submitted that the rejection of claims 13, 26, and 39 (Group 1D) over the combination of the Knudsen and Graefe patents should be reversed.

B. Issue 2: The Rejection of Claims 8-12, 21-25, and 34-38 as Obvious over the Knudsen, Graefe, and DeLong Combination Should be Reversed.

1. Claims 8-12, 21-25, and 34-38 (Group 2A) are not Obvious over the Knudsen, Graefe, and DeLong Combination.

Claims 8-12, 21-25, and 34-38 depend from independent claims 1, 14, and 27 and by their dependency incorporate the claim requirement that if a rule definition does not specify an output table, for each rule definition, a replacement value is directly inserted in the fields in the input data column that match the find criteria and add additional novel claim requirements.

The Examiner is incorrect in rejecting claims 8-12, 21-25, and 34-38 (Group 2A) as being

unpatentable over the Knudsen patent in view of the Graefe patent and further in view of the DeLong patent. The Examiner has failed to establish that the Knudsen patent or the Graefe patent or the DeLong patent, either alone or in combination, have any description, express or inherent, that if a rule definition does not specify an output table, for each rule definition, the replacement value is directly inserted in the fields in the input data column that match the find criteria.

Accordingly, it is respectfully submitted that the rejection of claims 8-12, 21-25, and 34-38 over the combination of the Knudsen, Graefe, and DeLong patents should be reversed.

The DeLong patent does not overcome the deficiencies of the Knudsen patent or the Graefe patent in that the DeLong patent does not teach or suggest the claim requirement that if a rule definition does not specify an output table, for each rule definition, a replacement value is directly inserted in the fields in the input data column that match the find criteria and add additional novel claim requirements.

Claims 9, 12, 22, 25, 35, and 38 further require at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

The DeLong patent is cited at Col. 1, lines 33-38 as teaching the claim requirement that at least one rule definition including find criteria having upper and lower bounds includes multiple

find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field. The cited portion of the DeLong patent indicates that a search begins at an upper or lower bound of a table and progresses until the desired key value is located or the opposite bound is reached, and then the associated data value(s) are reached. The DeLong patent, however, does not teach or suggest, that a rule definition includes multiple find criteria with a replacement value for each find criteria. The mention of a search in the DeLong patent does not provide a teaching or suggestion of the claimed multiple find criteria and a replacement value for each find criteria.

The Knudsen patent is cited at Col. 70, lines 24-55 as teaching the claim requirement that (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content. The cited portion of the Knudsen patent describes a LIKE relational operator that has two operands, a field name and a pattern. The result of the relation is true if the value of the field in a row matches the pattern. That is, the LIKE operator specifies a single find criteria, rather than the claimed multiple find criteria. Since there is only a single find criteria, there is no need for a replacement value for each find criteria in the Knudsen patent. Also, since the Knudsen patent teaches that there is only a single find criteria, the Knudsen patent teaches away from performing a search until none of the multiple find criteria are found to match the field content. Also, instead of inserting the replacement value corresponding to one find criteria from the multiple find criteria that matched the field content as claimed, the Knudsen patent describes that the LIKE operator returns true if the value of the field in the row matches a pattern. That is, the cited LIKE operator does not

insert a replacement value.

Claims 10, 23, and 26 further require searching comprises searching for any fields that have values outside of one of the upper and lower bounds. The DeLong patent states: a search begins at an upper or lower bound of the table and progresses until the desired key value is located or until the opposite bound is reached. (Col. 1, lines 33-48) Therefore, the DeLong patent teaches away from searching for any fields that have values outside of one of the upper and lower bounds.

Claims 11, 24, and 37 are similar to claims 9, 12, 22, 25, 35, and 38 and further require that the replacement value is an upper replacement value and further comprising a lower replacement value, wherein inserting comprises inserting the upper replacement value if the field has a value greater than the upper bound and inserting the lower replacement value if the field has a value less than the lower bound. The Office Action states that the Knudsen and Graefe patents do not clearly teach an upper bound and lower bound. The cited portion of the DeLong patent at Col. 1, lines 33-48 describes that when a match occurs, associated data value(s) are retrieved. The DeLong patent does not teach or suggest the claim requirement of inserting the upper replacement value if the field has a value greater than the upper bound and inserting the lower replacement value if the field has a value less than the lower bound.

Accordingly, it is respectfully submitted that the rejection of claims 8-12, 21-25, and 34-38 over the combination of the Knudsen, Graefe, and DeLong patents should be reversed.

IX Conclusion

Each of the rejections set forth in the final Office Action is improper and should be reversed.

Respectfully submitted,

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Dated: May 25, 2003

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X. Appendix

The claims on appeal are as follows:

1. (Previously Amended) A method for performing a clean operation on an input table having an input table name, comprising:
 - receiving at least one rule definition, wherein each rule definition indicates a find criteria, a replacement value, and an input data column in the input table;
 - searching, for each rule definition, the input data column for any fields that match the find criteria; and
 - if the rule definition does not specify an output table, directly inserting, for each rule definition, the replacement value in the fields in the input data column that match the find criteria, wherein subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions.
2. (Original) The method of claim 1, wherein each rule definition is associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.
3. (Original) The method of claim 1, wherein there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the

rule definition including the find criteria and replacement value for that rule definition.

4. (Original) The method of claim 1, wherein the input data column for a first and second applied rule definitions is the same input data column, wherein the replacement value for the first rule definition is inserted into at least one field in the input data column, and wherein the find criteria of the second rule definition is applied to the replacement value inserted in the input data column.

5. (Original) The method of claim 1, wherein at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

6. (Original) The method of claim 5, wherein a sort column includes values to use to sort the multiple find criteria and corresponding replacement value, wherein the step of searching comprises applying the multiple find criteria to each field in the order specified in the sort column.

7. (Original) The method of claim 1, wherein the rule definition comprises a type of rule that is a member of the set of rules consisting of: find and replace, discretization, and

numeric clip, wherein at least two rule definitions are comprised of different rule types.

8. (Original) The method of claim 1, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound, wherein searching comprises searching for any fields that have values within the upper and lower bounds.

9. (Original) The method of claim 8, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

10. (Original) The method of claim 8, wherein searching comprises searching for any fields that have values outside of one of the upper and lower bounds.

11. (Original) The method of claim 1, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound and wherein the replacement value is an upper replacement value and further comprising a lower replacement value, wherein searching comprises searching for any fields that have values within the upper and lower bounds and wherein inserting comprises inserting the upper replacement value if the field has a value greater

than the upper bound and inserting the lower replacement value if the field has a value less than the lower bound.

12. (Original) The method of claim 11, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding upper and lower replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

13. (Original) The method of claim 1, wherein the rule definitions include a row clean flag, and wherein at least one rule definition has the row clean flag set, further comprising removing any row including a field matching the search criteria from the input table when the row clean flag is set.

14. (Previously Amended) A system for performing a clean operation on an input table having an input data table name, comprising;

means for receiving at least one rule definition, wherein each rule definition indicates a find criteria, a replacement value, and an input data column in the input table;

means for searching, for each rule definition, the input data column for any fields that match the find criteria; and

means for, if the rule definition does not specify an output table, directly inserting, for each rule definition, the replacement value in the fields in the input data column that match the find criteria, wherein subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions.

15. (Original) The system of claim 14, wherein each rule definition is associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

16. (Original) The system of claim 14, wherein there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition.

17. (Original) The system of claim 14, wherein the input data column for a first and second applied rule definitions is the same input data column, further comprising:

means for inserting the replacement value for the first rule definition into at least one field in the input data column; and

means for applying the find criteria of the second rule definition to the replacement value inserted in the input data column.

18. (Original) The system of claim 14, wherein at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the means for searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

19. (Original) The system of claim 18, wherein a sort column includes values to use to sort the multiple find criteria and corresponding replacement value, wherein the means for searching comprises applying the multiple find criteria to each field in the order specified in the sort column.

20. (Original) The system of claim 14, wherein the rule definition comprises a type of rule that is a member of the set of rules consisting of: find and replace, discretization, and numeric clip, wherein at least two rule definitions are comprised of different rule types.

21. (Original) The system of claim 14, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound, wherein the means for searching comprises searching for any fields that have values within the upper and lower bounds.

22. (Original) The system of claim 21, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a

corresponding replacement value for each find criteria, wherein the means for searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein the means for inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

23. (Original) The system of claim 20, wherein the means for searching comprises searching for any fields that have values outside of one of the upper and lower bounds.

24. (Original) The system of claim 14, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound and wherein the replacement value is an upper replacement value and further comprising a lower replacement value, wherein the means for searching comprises searching for any fields that have values within the upper and lower bounds and wherein inserting comprises inserting the upper replacement value if the field has a value greater than the upper bound and inserting the lower replacement value if the field has a value less than the lower bound.

25. (Original) The system of claim 24, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding upper and lower replacement value for each find criteria, wherein the means for searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the

field content, and wherein the means for inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

26. (Original) The system of claim 14, wherein the rule definitions include a row clean flag, and wherein at least one rule definition has the row clean flag set, further comprising removing any row including a field matching the search criteria from the input table when the row clean flag is set.

27. (Previously Amended) An article of manufacture for use performing a clean operation on an input table in a database having an input data table name, the article of manufacture comprising computer usable media including at least one computer program embedded therein that causes the computer to perform:

receiving at least one rule definition, wherein each rule definition indicates a find criteria, a replacement value, and an input data column in the input table;

searching, for each rule definition, the input data column for any fields that match the find criteria; and

if the rule definition does not specify an output table, directly inserting, for each rule definition, the replacement value in the fields in the input data column that match the find criteria, wherein subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions.

28. (Original) The article of manufacture of claim 27, wherein each rule definition is associated with one rule table including the find criteria and replacement value, wherein a rule table column parameter for each rule definition indicates the columns in the rule table including the find criteria and replacement value for the rule definition.

29. (Original) The article of manufacture of claim 27, wherein there is a separate rule table including the find criteria and replacement value associated with at least one rule definition, wherein, for each rule definition, a rule table column parameter indicates the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition.

30. (Original) The article of manufacture of claim 27, wherein the input data column for a first and second applied rule definitions is the same input data column, wherein the replacement value for the first rule definition is inserted into at least one field in the input data column, and wherein the find criteria of the second rule definition is applied to the replacement value inserted in the input data column.

31. (Original) The article of manufacture of claim 27, wherein at least one rule definition includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value

comprises inserting the replacement value corresponding to one find criteria that matched the field content.

32. (Original) The article of manufacture of claim 31, wherein a sort column includes values to use to sort the multiple find criteria and corresponding replacement value, wherein the step of searching comprises applying the multiple find criteria to each field in the order specified in the sort column.

33. (Original) The article of manufacture of claim 27, wherein the rule definition comprises a type of rule that is a member of the set of rules consisting of: find and replace, discretization, and numeric clip, wherein at least two rule definitions are comprised of different rule types.

34. (Original) The article of manufacture of claim 27, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound, wherein searching comprises searching for any fields that have values within the upper and lower bounds.

35. (Original) The article of manufacture of claim 34, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content,

and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

36. (Original) The article of manufacture of claim 34, wherein searching comprises searching for any fields that have values outside of one of the upper and lower bounds.

37. (Original) The article of manufacture of claim 27, wherein the find criteria for at least one rule definition comprises an upper bound and lower bound and wherein the replacement value is an upper replacement value and further comprising a lower replacement value, wherein searching comprises searching for any fields that have values within the upper and lower bounds and wherein inserting comprises inserting the upper replacement value if the field has a value greater than the upper bound and inserting the lower replacement value if the field has a value less than the lower bound.

38. (Original) The article of manufacture of claim 37, wherein the at least one rule definition including find criteria having upper and lower bounds includes multiple find criteria and a corresponding upper and lower replacement value for each find criteria, wherein the step of searching the input data column comprises applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein inserting the replacement value comprises inserting the replacement value corresponding to one find criteria that matched the field content.

39. (Original) The article of manufacture of claim 27, wherein the rule definitions include a row clean flag, and wherein at least one rule definition has the row clean flag set, further comprising removing any row including a field matching the search criteria from the input table when the row clean flag is set.

40. (Previously Amended) A memory device including a command for performing a clean operation on a computer database input table, the command comprising

an input data table name parameter indicating the input table subject to the clean operation; and

at least one rule definition, wherein each rule definition includes a find criteria, a replacement value, and an input data column in the input table, wherein, for each rule definition, the input data column is searched for any fields that match the find criteria, wherein, for each rule definition, if the rule definition does not specify an output table, the replacement value is directly inserted in the fields in the input data column that match the find criteria, and wherein subsequent applications of additional rule definitions applied to the same input data column operate on replacement values inserted in the input data column in previously applied rule definitions.

41. (Original) The memory device of claim 40, wherein at least one rule definition further includes:

indication of one rule table including the find criteria and replacement value for the at least two rule definitions, such that the one rule table includes the find criteria and replacement

value for the at least two rule definitions; and

a rule table column parameter for the at least two rule definitions indicating the columns in the rule table including the find criteria and replacement value for the rule definitions.

42. (Original) The memory device of claim 40, wherein at least one rule definition further includes:

indication of a separate rule table for each rule definition including the find criteria and replacement value for the at least two rule definitions; and

a rule table column parameter indicating the columns in the rule table for the rule definition including the find criteria and replacement value for that rule definition.

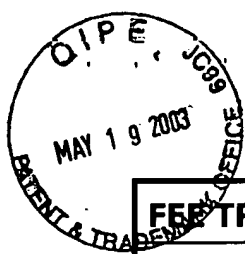
43. (Original) The memory device of claim 40, wherein the input data column for a first and second applied rule definitions is the same input data column.

44. (Original) The memory device of claim 40, wherein at least one rule definition further includes:

multiple find criteria and a corresponding replacement value for each find criteria, wherein the input data column is searched by applying each of the multiple find criteria to one field until one of: (i) a match occurs and (ii) none of the multiple find criteria are found to match the field content, and wherein the replacement value corresponding to the matching find criteria is inserted into the field.

45. (Original) The memory device of claim 4, wherein the at least one rule definition further comprises a sort column including values to use to sort the multiple find criteria and corresponding replacement value, wherein the multiple find criteria are applied to each field in the input data column in the order specified in the sort column.

46. (Original) The memory device of claim 40, wherein the rule definition comprises a type of rule that is a member of the set of rules consisting of: find and replace, discretization, and numeric clip, wherein at least two rule definitions are comprised of different rule types.

PTO/SB/17
0055.0009

FEE TRANSMITTAL for FY 2002	Application Number	09/399,694
	Filing Date	September 21, 1999
	Inventor	M.A. Cesare et al.
	Group Art Unit	2172
	Examiner Name	Nguyen, Tam V.
Total Amount of Payment: \$320.00		Attorney Docket Number ST999037

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Technology Center 2100

METHOD OF PAYMENT (check one)

1. The Commissioner is hereby authorized to charge the indicated fees and/or credit any overpayments to Deposit Account Number: **09-0460**

■ Charge any additional fee required under 37 CFR 1.16 and 1.17

■ Charge any deficiency or credit any overpayment

2. ☐ Payment enclosed:

☐ Check; _____ Check No.

☐ Money Order

☐ Credit Card Approval for _____

FEE CALCULATION**1. BASIC FILING FEE**

Utility Filing Fee:

Large Entity Fee Code 101 \$750.00

Fee Submitted: \$ _____

2. EXTRA CLAIMS FEES

Total Claims ____ - 20* x \$18= \$ _____

Independent

Claims ____ - 3* x \$84= \$ _____

Multiple Dependent \$280 \$ _____

Subtotal \$ _____

*(or number previously paid for)

FEE CALCULATION (continued)**3. ADDITIONAL FEES (large entity)**☐ Surcharge- late filing fee or oath \$130☐ Surcharge- late provisional filing fee
or cover sheet \$50☐ Non-English specification \$130☐ International type search report \$40☐ Requesting publication of SIR prior to action \$920☐ Requesting publication of SIR after action \$1840☐ Extension for reply- first month \$110☐ Extension for reply- second month \$410☐ Extension for reply- third month \$930☐ Extension for reply- fourth month \$1450☐ Extension for reply- fifth month \$1970☐ Notice of Appeal \$320

■ Brief in Support of Appeal \$320

☐ Request for Oral Hearing \$280☐ Utility issue fee \$1300☐ Petition to revive (unavoidable) \$110☐ Petition to revive (unintentional) \$1300☐ Petitions to the Commissioner \$130☐ Petitions related to provisional applications \$50☐ Submission of Information Disclosure

Statement \$180

☐ Recordation of Assignment \$40☐ Submission after final \$740

(37 CFR 1.129(a))


☐ Request for Continued Examination \$750

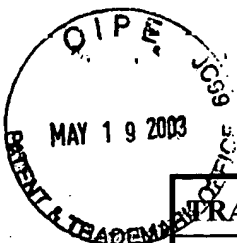
(RCE)

☐ Other:

SUBTOTAL \$ 320.00

Submitted by:

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Date: May 15, 2003	Telephone: (310) 553-7973	



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\$

PTO/SB/21
0055.0009

TRANSMITTAL FORM <i>(To be used for all correspondence after initial filing)</i>	Application Number	09/399,694
	Filing Date	September 21, 1999
	Inventor	M.A. Cesare et al.
	Group Art Unit	2172
	Examiner Name	Nguyen, Tam V.
Total Number of Pages in this Submission: 35	Attorney Docket Number	ST999037

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MAY 21 2003

ENCLOSURES (check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment/Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits /Declarations <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement; ___ references <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an application) <input type="checkbox"/> Drawing(s); ___ sheets <input type="checkbox"/> Licensing-related papers <input type="checkbox"/> Petition: _____ <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation, and/or Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) ___	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input checked="" type="checkbox"/> Appeal Communication to Group (<i>Appeal Notice, Brief, Reply Brief</i>) In Triplicate <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input type="checkbox"/> Certificate of Correction <input type="checkbox"/> Other Enclosure(s) (<i>please identify below</i>)
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual Name:	Janaki K. Davda, Registration No. 40,684
Signature:	<i>Janaki K. Davda</i>
Date:	May 15, 2003
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<input checked="" type="checkbox"/> The Commissioner is authorized to charge any deficiency of fees, or credit any overpayment, Deposit Account No. 09-0460	

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to Commissioner for Patents, Alexandria, VA 22313-1450, or being facsimile transmitted to the USPTO, on the date indicated below.		
Typed or Printed name:	Janaki K. Davda	 24033 PATENT TRADEMARK OFFICE
Signature:	<i>Janaki K. Davda</i>	
Date:	May 15, 2003	